

WHAT IS CLAIMED IS:

1                   1.       A method for reducing a condition associated with fetal alcohol  
2 syndrome in a subject who is exposed to alcohol *in utero*, the method comprising  
3 administering to the subject an ADNF polypeptide in an amount sufficient to reduce the  
4 condition associated with fetal alcohol syndrome.

1                   2.       The method of claim 1, wherein the ADNF polypeptide is a  
2 member selected from the group consisting of:

3                   (a) an ADNF I polypeptide comprising an active core site having the  
4 following amino acid sequence:

5                   Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1);

6                   (b) an ADNF III polypeptide comprising an active core site having the  
7 following amino acid sequence:

8                   Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2); and

9                   (c) a mixture of the ADNF I polypeptide of part (a) and the ADNF III  
10 polypeptide of part (b).

1                   3.       The method of claim 1, wherein the ADNF polypeptide is a  
2 member selected from the group consisting of a full length ADNF I polypeptide, a full  
3 length ADNF III polypeptide, and a mixture of a full length ADNF I polypeptide and a  
4 full length ADNF III polypeptide.

1                   4.       The method of claim 1, wherein the ADNF polypeptide is an  
2 ADNF I polypeptide.

1                   5.       The method of claim 4, wherein the ADNF I polypeptide is Ser-  
2 Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1).

1                   6.       The method of claim 4, wherein the ADNF I polypeptide is  
2 selected from the group consisting of:

3                   Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4                   Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5 Ala (SEQ ID NO:15);

6                   Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);

- 7 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18); and  
9 Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19).

1 7. The method of claim 4, wherein the ADNF I polypeptide  
2 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3 of the active core site.

1 8. The method of claim 1, wherein the ADNF polypeptide is an  
2 ADNF III polypeptide.

1 9. The method of claim 8, wherein the ADNF III polypeptide is Asn-  
2 Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 10. The method of claim 8, wherein the ADNF III polypeptide is  
2 selected from the group consisting of:

- 3 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
4 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);  
5 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
6 NO:22); and  
7 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
8 (SEQ ID NO:23).

1 11. The method of claim 8, wherein the ADNF III polypeptide  
2 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3 of the active core site.

1 12. The method of claim 1, wherein the ADNF polypeptide is a  
2 mixture of an ADNF I polypeptide of part (a) and an ADNF III polypeptide of part (b).

1 13. The method of claim 12, wherein the ADNF I polypeptide is Ser-  
2 Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the ADNF III  
3 polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 14. The method of claim 12, wherein the ADNF I polypeptide is  
2 selected from the group consisting of:

- 3 Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4 Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5 Ala (SEQ ID NO:15);  
6 Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);  
7 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18);  
9 Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and  
10 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III  
11 polypeptide is selected from the group consisting of:  
12 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2);  
13 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
14 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);  
15 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
16 NO:22); and  
17 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
18 (SEQ ID NO:23).

1 15. The method of claim 12, wherein the ADNF I polypeptide  
2 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3 of the active core site of the ADNF I polypeptide, and wherein the ADNF III polypeptide  
4 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
5 of the active core site of the ADNF III polypeptide.

1 16. The method of claim 1, wherein at least one of the ADNF  
2 polypeptide is encoded by a nucleic acid which is administered to the subject.

1 17. The method of claim 1, wherein the condition is decreased body  
2 weight of the subject.

1 18. The method of claim 1, wherein the condition is decreased brain  
2 weight of the subject.

1 19. The method of claim 1, wherein the condition is a decreased level  
2 of VIP mRNA or protein of the subject.

1 20. The method of claim 1, wherein the condition is decreased viability  
2 of the subject *in utero*.

1                   21.     The method of claim 1, wherein the condition is decreased  
2     learning.

1                   22     A method for reducing neuronal cell death, the method comprising  
2     contacting a neuronal cell with a mixture of an ADNF I polypeptide and an ADNF III  
3     polypeptide in an amount sufficient to reduce neuronal cell death,  
4                   wherein the ADNF I polypeptide comprises an active core site having the  
5     following amino acid sequence:  
6                   Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and  
7                   wherein the ADNF III polypeptide comprises an active core site having the  
8     following amino acid sequence:  
9                   Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1                   23.     The method of claim 22, wherein the ADNF I polypeptide is a full  
2     length ADNF I polypeptide and the ADNF III polypeptide is a full length ADNF III  
3     polypeptide.

1                   24.     The method of claim 22, wherein the ADNF I polypeptide is Ser-  
2     Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the ADNF III  
3     polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1                   25.     The method of claim 22, wherein the ADNF I polypeptide is  
2     selected from the group consisting of:  
3                   Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);  
4                   Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5                   Ala (SEQ ID NO:15);  
6                   Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);  
7                   Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8                   Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18);  
9                   Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and  
10                  Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III  
11     polypeptide is selected from the group consisting of:  
12                  Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2);  
13                  Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
14                  Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);

15 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
16 NO:22); and  
17 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
18 (SEQ ID NO:23).

1 26. The method of claim 22, wherein the ADNF I polypeptide  
2 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3 of the active core site of the ADNF I polypeptide, and wherein the ADNF III polypeptide  
4 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
5 of the active core site of the ADNF III polypeptide.

1 27. The method of claim 22, wherein at least one of the ADNF  
2 polypeptide is encoded by a nucleic acid.

1 28. A pharmaceutical composition comprising a pharmaceutically  
2 acceptable excipient and a mixture of an ADNF I polypeptide and an ADNF III  
3 polypeptide, wherein the ADNF I polypeptide comprises an active core site having the  
4 following amino acid sequence:

5 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and  
6 wherein the ADNF III polypeptide comprises an active core site having the following  
7 amino acid sequence:

8 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 29. The pharmaceutical composition of claim 28, wherein the ADNF I  
2 polypeptide is a full length ADNF I polypeptide and the ADNF III polypeptide is a full  
3 length ADNF III polypeptide.

1 30. The pharmaceutical composition of claim 28, wherein the ADNF I  
2 polypeptide is Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the  
3 ADNF III polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 31. The pharmaceutical composition of claim 28, wherein the ADNF I  
2 polypeptide is selected from the group consisting of:

3 Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);  
4 Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5 Ala (SEQ ID NO:15);

6 Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);  
7 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18)  
9 Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and  
10 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III  
11 polypeptide is selected from the group consisting of:  
12 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2)  
13 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
14 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);  
15 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
16 NO:22); and  
17 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
18 (SEQ ID NO:23).

1 32. The pharmaceutical composition of claim 28, wherein the ADNF I  
2 polypeptide comprises up to about 20 amino acids at at least one of the N-terminus and  
3 the C-terminus of the active core site of the ADNF I polypeptide, and wherein the ADNF  
4 III polypeptide comprises up to about 20 amino acids at at least one of the N-terminus and  
5 the C-terminus of the active core site of the ADNF III polypeptide.

1 33. The pharmaceutical composition of claim 28, wherein at least one  
2 of the ADNF polypeptide is encoded by a nucleic acid.